

Listing of Claims

1-107. (Cancelled).

- 1 108. (Original) A reversed cubic or reversed hexagonal phase material comprising
2 water or glycerol or a water/glycerol mixture
3 an anesthetic, and
4 a surfactant selected from the group consisting of fluorosurfactants, BRIJ-type
5 surfactants, Triton-like surfactants, surfactants with polymer chains, peptide-based surfactants,
6 isoprenoids, plasmalogens, cerebroside, sulphatides, gangliosides, cyclopentatriol lipids,
7 dimethylaminopropane lipids, lysolipids, lysolecithins, anionic surfactants, cationic surfactants,
8 zwitterionic or semipolar surfactants, benzalkonium chloride, sodium deoxycholate, myristyl-
9 gamma-picolinium chloride, polyoxyl 35 castor oil, sorbitan monopalmitate, and sodium 2-
10 ethylhexanoic acid.
- 1 109. (Original) The reversed cubic or reversed hexagonal phase material of claim 108, wherein
2 said anionic surfactant is selected from the group consisting of sodium oleate, sodium dodecyl
3 sulfate, sodium diethylhexyl sulfosuccinate, sodium dimethylhexyl sulfosuccinate, sodium di-2-
4 ethylacetate, sodium 2-ethylhexyl sulfate, sodium undecane-3-sulfate, sodium
5 ethylphenylundecanoate, carboxylate soaps of the form IC_n where the chain length n is between 8
6 and 20 and I is a monovalent counterion selected from the group consisting of lithium, sodium,
7 potassium and rubidium.
- 1 110.(Original) The reversed cubic or reversed hexagonal phase material of claim 108, wherein
2 said cationic surfactant is selected from the group consisting of myristyl-gamma-picolinium
3 chloride, and benzalkonium benzoate.
- 1 111. (Original) The reversed cubic or reversed hexagonal phase material of claim 108, wherein
2 said zwitterionic or semipolar surfactant is selected from the group consisting of N,N,N-

3 trimethylaminodecanoimide, amine oxide surfactants with alkyl chain length from 8 to 18
4 carbons, dodecyldimethylammoniopropane-1-sulfate, dodecyldimethylammoniobutyrate,
5 dodecyltrimethylene di(ammonium chloride), decylmethylsulfonediimine, and
6 dimethyleicosylammoniohexanoate.

1 112. (Original) The reversed cubic or reversed hexagonal phase material of claim 108 wherein
2 said anesthetic is a hydrophobe.

1 113. (Original) The reversed cubic or reversed hexagonal phase material of claim 108 wherein
2 said anesthetic is a local anesthetic.

1 114. (Original) The reversed cubic or reversed hexagonal phase material of claim 108 wherein
2 said anesthetic is eugenol.

1 115. (Original) The reversed cubic or reversed hexagonal phase material of claim 108 wherein
2 said anesthetic is lidocaine.

1 116. (Original) The reversed cubic or reversed hexagonal phase material of claim 108 wherein
2 said anesthetic is droperidol.

1 117. (Original) The reversed cubic or reversed hexagonal phase material of claim 108 wherein
2 said anesthetic is butacaine.

1 118. (Original) The reversed cubic or reversed hexagonal phase material of claim 108 wherein
2 said anesthetic is ecgonine.

1 119. (Original) The reversed cubic or reversed hexagonal phase material of claim 108 wherein
2 said anesthetic is procaine.

1 120. (Original) The reversed cubic or reversed hexagonal phase material of claim 108, wherein
2 said reversed cubic or reversed hexagonal phase material is formed into a stabilized particle.

1 121. (Original) The reversed cubic or reversed hexagonal phase material of claim 120, wherein
2 said stabilized particle is coated with a coating.

1 122. (Original) The reversed cubic or reversed hexagonal phase material of claim 121 wherein
2 said coating is non-lamellar.

1 123. (Original) The reversed cubic or reversed hexagonal phase material of claim 121 wherein
2 said coating is lamellar.

1 124. (Original) A reversed cubic or reversed hexagonal phase material comprising
2 water or glycerol or a water/glycerol mixture
3 an anesthetic, and
4 a phospholipid.

1 125. (Original) The reversed cubic or reversed hexagonal phase material of claim 124, wherein
2 said reversed cubic or reversed hexagonal phase material is a reversed cubic phase material.

1 126. (Original) The reversed cubic or reversed hexagonal phase material of claim 125, wherein
2 said reversed cubic phase is bicontinuous.

1 127. (Original) The reversed cubic or reversed hexagonal phase material of claim 124 wherein
2 said anesthetic is a hydrophobe.

1 128. (Original) The reversed cubic or reversed hexagonal phase material of claim 124 wherein
2 said anesthetic is a local anesthetic.

1 129. (Original) The reversed cubic or reversed hexagonal phase material of claim 124 wherein
2 said anesthetic is eugenol.

1 130. (Original) The reversed cubic or reversed hexagonal phase material of claim 124 wherein
2 said anesthetic is lidocaine.

1 131. (Original) The reversed cubic or reversed hexagonal phase material of claim 124 wherein
2 said anesthetic is droperidol.

1 132. (Original) The reversed cubic or reversed hexagonal phase material of claim 124 wherein
2 said anesthetic is butacaine.

1 133. (Original) The reversed cubic or reversed hexagonal phase material of claim 124 wherein
2 said anesthetic is ecgonine.

1 134. (Original) The reversed cubic or reversed hexagonal phase material of claim 124 wherein
2 said anesthetic is procaine.

1 135. (Original) The reversed cubic or reversed hexagonal phase material of claim 124, wherein
2 said reversed cubic or reversed hexagonal phase material is formed into a stabilized particle.

1 136. (Original) The reversed cubic or reversed hexagonal phase material of claim 135, wherein
2 said stabilized particle is coated with a coating.

1 137. (Original) The reversed cubic or reversed hexagonal phase material of claim 136, wherein
2 said coating is non-lamellar.

1 138. (Original) The reversed cubic or reversed hexagonal phase material of claim 136, wherein
2 said coating is lamellar.

1 139. (Original) A coated particle comprising an interior core comprising a matrix consisting
2 essentially of

3 a) at least one nanostructured liquid phase,

4 b) at least one nanostructured liquid crystalline phase or

5 c) a combination of

6 i) at least one nanostructured liquid phase and

7 ii) at least one nanostructured liquid crystalline phase,

8 wherein the matrix comprises

9 a surfactant or block copolymer

10 a polar solvent, and

11 an anesthetic.

1 140. (Original) The coated particle of claim 139 wherein said coated particle is coated with a
2 lamellar coating.

1 141. (Original) The coated particle of claim 139 wherein said coated particle is coated with a
2 non-lamellar coating.

1 142. (Original) The coated particle of claim 139 wherein said anesthetic is a hydrophobe.

1 143. (Original) The coated particle of claim 139 wherein said anesthetic is a local anesthetic.

1 144. (Original) The coated particle of claim 139 wherein said anesthetic is selected from the
2 group consisting of eugenol, lidocaine, droperidol, butacaine, ecgonine, and procaine.

1 145. (Original) The coated particle of claim 139 wherein said surfactant is selected from the
2 group consisting of fluorosurfactants, glycolipids that bind bacteria, BRIJ-type surfactants,
3 Triton-like surfactants, peptide-based surfactants, surfactants consisting of an alkane chain linked
4 to a polar group, MGDG, DGDG, diacylglycerol, diacylglycerol glycerols, gentiobiosyls, isoprenoids,

ceramides, plasmalogens, cerebroside, sulphatides, gangliosides, cyclopentatriol lipids, dimethylaminopropane lipids, lysolipids, lysolecithins, anionic surfactants, cationic surfactants, nonionic PEGylated surfactants of the formula C_nE_m in which C is an alkane chain with n carbon atoms and n ranges from 6 to 20 and E represents ethylene oxide groups of number m and m ranges from 2 to 80, zwitterionic or semipolar surfactants, benzalkonium chloride, sodium deoxycholate, myristyl-gamma-picolinium chloride, polyoxyl 35 castor oil, sorbitan monopalmitate, and sodium 2-ethylhexanoic acid.

146. (Original) The coated particle of claim 139 wherein said block copolymer is selected from the group consisting of polystyrene b-butadiene, polystyrene b-isoprene, polystyrene b-styrenesulfonic acid, polyethyleneoxide-b-propyleneoxide, polystyrene-b-dimethylsiloxane, polyethyleneoxide-b-styrene, polynorbornene-b-5-((trimethylsiloxy)methyl)norbornene, polyacetylene-b-5-((trimethylsiloxy)methyl)norbornene, polyacetylene-b-norbornene, polyethyleneoxide-b-norbornene, polybutyleneoxide-b-ethyleneoxide, polyethyleneoxide-b-siloxane, and triblock copolymer polyisoprene-b-styrene-b-2-vinylpyridine..

147. (Original) A cubic phase liquid crystalline material comprising a glycolipid that is capable of binding bacteria.

148. (Original) The cubic phase liquid crystalline material of claim 147, wherein said cubic phase liquid crystalline material is formed into a stabilized particle, wherein said stabilized particle comprises a matrix having a cubic phase consisting essentially of

- a) at least one nanostructured liquid phase,
- b) at least one nanostructured liquid crystalline phase or
- c) a combination of
 - i) at least one nanostructured liquid phase and
 - ii) at least one nanostructured liquid crystalline phase.

1 149. (Original) The cubic phase liquid crystalline material of claim 148, wherein said stabilized
2 particle is coated with a coating.

1 150. (Original) The cubic phase liquid crystalline material of claim 149, wherein said coating is
2 non-lamellar.

1 151. (Original) The cubic phase liquid crystalline material of claim 149, wherein said coating is
2 lamellar.

1 152. (Original) The cubic phase liquid crystalline material of claim 147, wherein said glycolipid
2 is selected from the group consisting of sphingolipids, gentiobiosyls, ceramides, cerebroside,
3 sulfatides, and gangliosides.

1 153. (Original) The cubic phase liquid crystalline material of claim 148, wherein said stabilized
2 particle includes a surfactant.

1 154. (Original) A coated particle comprising
2 a. an interior core comprising a matrix consisting essentially of
3 i) at least one nanostructured liquid phase,
4 ii) at least one nanostructured liquid crystalline phase or
5 iii) a combination of
6 (1) at least one nanostructured liquid phase and
7 (2) at least one nanostructured liquid crystalline phase,
8 wherein at least a portion of said matrix is not a cubic phase but can be converted to a cubic
9 phase, and
10 b. an exterior coating comprising a non-lamellar crystalline material.

1 155. (Original) The coated particle of claim 154, wherein said portion of said matrix that is not a
2 cubic phase is converted to a cubic phase by a stimulus selected from the group consisting of a

change in temperature, a change in hydration, dilution with water, a change of pH, removal of a volatile solvent, and addition of a polar solvent.

156. (Original) A non-lamellar coated particle having an interior core comprising a matrix consisting essentially of

- a) at least one nanostructured liquid phase,
- b) at least one nanostructured liquid crystalline phase or
- c) a combination of
 - i) at least one nanostructured liquid phase and
 - ii) at least one nanostructured liquid crystalline phase, and

wherein the matrix comprises a surfactant or lipid comprising a polar head group that modifies interfacial physics of an aqueous phase at a polar-apolar interface.

157. (Original) A coated particle comprising

- a) an interior core comprising a matrix consisting essentially of
 - i) at least one nanostructured liquid phase,
 - ii) at least one nanostructured liquid crystalline phase or
 - iii) a combination of
 - (1) at least one nanostructured liquid phase and
 - (2) at least one nanostructured liquid crystalline phase and

b) an exterior coating comprising a nonlamellar crystalline material,
wherein the matrix comprises a surfactant having one or more hydrophilic polymer blocks totaling at least 1,000 Daltons in molecular weight.

158. (Original) A coated particle with a core comprising a matrix consisting essentially of a reversed cubic or reversed hexagonal phase comprising

- water or glycerol or a water-glycerol mixture, and
- a nonionic surfactant with a PEG head groups ether-linked to an alkane chain.

1 159. (Original) A coated particle having an interior core comprising a matrix consisting
2 essentially of

- 3 a) at least on nanostructured liquid phase,
- 4 b) at least one nanostructured liquid crystalline phase or
- 5 c) a combination of
 - 6 i) at least one nanostructured liquid phase and
 - 7 ii) at least one nanostructured liquid crystalline phase, and

8 wherein said matrix comprises a surfactant selected from the group consisting of
9 fluorosurfactants, glycolipids that bind bacteria, BRIJ-type surfactants, Triton-like surfactants,
10 peptide-based surfactants, surfactants, MGDG, DGDG, diacylglycerol, diacylglycerol glycerols,
11 gentiobiosyls, isoprenoids, ceramides, plasmalogens, cerebroside, sulphatides, gangliosides,
12 cyclopentatriol lipids, dimethylaminopropane lipids, lysolipids, lysolecithins, anionic surfactants,
13 cationic surfactants, nonionic PEGylated surfactants of the formula C_nEm in which C is an
14 alkane chain with n carbon atoms and n ranges from 6 to 20 and E represents ethylene oxide
15 groups of number m and m ranges from 2 to 80, zwitterionic or semipolar surfactants,
16 benzalkonium chloride, sodium deoxycholate, myristyl-gamma-picolinium chloride, polyoxyl 35
17 castor oil, sorbitan monopalmitate, and sodium 2-ethylhexanoic acid.

1 160. (Original) The coated particle of claim 159 wherein anionic surfactant is selected from the
2 group consisting of sodium oleate, sodium dodecyl sulfate, sodium diethylhexyl sulfosuccinate,
3 sodium dimethylhexyl sulfosuccinate, sodium di-2-ethylacetate, sodium 2-ethylhexyl sulfate,
4 sodium undecane-3-sulfate, sodium ethylphenylundecanoate, carboxylate soaps of the form IC_n
5 where the chain length n is between 8 and 20 and I is a monovalent counterion selected from the
6 group consisting of lithium, sodium, potassium and rubidium.

1 161. (Original) The coated particle of claim 159 wherein said cationic surfactant is selected from
2 the group consisting of myristyl-gamma-picolinium chloride, and benzalkonium benzoate.

1 162. (Original) The coated particle of claim 159 wherein said zwitterionic or semipolar surfactant

is selected from the group consisting of N,N,N-trimethylaminodecanoimide, amine oxide surfactants with alkyl chain length from 8 to 18 carbons, dodecyldimethylammonio propane-1-sulfate, dodecyldimethylammonio butyrate, dodecyltrimethylene di(ammonium chloride), decylmethylsulfonediimine, and dimethyleicosylammoniohexanoate.

163. (Original) The coated particle of claim 159 wherein said coated particle is coated with a non-lamellar coating.

164. (Original) The coated particle of claim 159 wherein said coated particle is coated with a lamellar coating.

165. (Original) A coated particle having an interior core comprising a matrix consisting essentially of

- a) at least one nanostructured liquid phase,
- b) at least one nanostructured liquid crystalline phase or
- c) a combination of
 - i) at least one nanostructured liquid phase and
 - ii) at least one nanostructured liquid crystalline phase, and

wherein said nanostructured liquid phase or said nanostructured liquid crystalline phase is made from a surfactant selected from the group consisting of fluorosurfactants, glycolipids that bind bacteria, BRIJ-type surfactants, Triton-like surfactants, peptide-based surfactants, MGDG, DGDG, diacylglycerol glycerols, gentiobiosyls, isoprenoids, ceramides, plasmalogens, cerebroside, sulphatides, gangliosides, cyclopentatriol lipids, dimethylaminopropane lipids, lysolipids, lysolecithins, anionic surfactants, cationic surfactants, nonionic PEGylated surfactants of the formula C_nE_m in which C is an alkane chain with n carbon atoms and n ranges from 6 to 20 and E represents ethylene oxide groups of number m and m ranges from 2 to 80, zwitterionic or semipolar surfactants, benzalkonium chloride, sodium deoxycholate, myristyl-gamma-picolinium chloride, polyoxyl 35 castor oil, sorbitan monopalmitate, and sodium 2-ethylhexanoic acid.

1 166. (Original) A coated particle with a core comprising a matrix consisting essentially of a
2 reversed cubic or reversed hexagonal phase comprising
3 water or glycerol or a water-glycerol mixture, and
4 a nonionic PEG-based surfactant of low HLB.

1 167. (Original) A coated particle comprising
2 a) an interior core comprising a matrix consisting essentially of a cubic phase, and
3 b) an exterior coating comprising a nonlamellar crystalline material,
4 wherein the cubic phase comprises polar domains composed substantially of polar moieties
5 comprising water and lipid head groups.

1 168. (Original) A coated particle as in Claim 167 wherein the head groups comprise hydrophilic
2 polymeric blocks selected from the group consisting of polyacrylics and polymethacrylics,
3 polyvinyl ethers, polyvinyl alcohols, polyacetals, polyvinyl ketones, polyvinyl nitriles, polyvinyl
4 esters, polystyrenes, polyphenylenes, polyoxides, polycarbonates, polyesters, polyanhydrides,
5 polyurethanes, polysulfonates, polysulfides, polysulfones, polyamides, polyhydrazides,
6 polyureas, polyphosphazenes, polysilanes, polysilazanes, polybenzoxazoles, polyoxadiazoles,
7 polyoxadiazolidines, polythiazoles, polybenzothiazoles, polypyromellitimides, polyquinoxalines,
8 polybenzimidazoles, polypiperazines, cellulose derivatives, alginic acid and its salts, chitin,
9 chitosan, glycogen, heparin, pectin, polyphosphorus nitrile chloride, polytri-n-butyl tin fluoride,
10 polyphosphoryldimethylamide, poly-4-n-butylpyridinium bromide, poly-2-N-methylpyridinium
11 iodide, polyallylammonium chloride, polysodium-sulfonate-trimethylene oxyethylene,
12 polyethylene oxide, polyacrylic acid and its salts, polymethacrylic acid and its salts, polyitaconic
13 acid and its salts, polyacrylamide, polyisopropylacrylamide, polyacrylonitrile, polystyrene
14 sulfonic acid and its salts, polyacrolein, polyvinyl pyridine, polyvinyl pyrrolidone, heparin,
15 pectin, chitin, chitosan, and alginic acid and its salts.

1 169. (Original) A coated particle with a core comprising a matrix consisting essentially of a
2 reversed cubic or reversed hexagonal phase comprising

3 water or glycerol or a water-glycerol mixture, and
4 a nonionic PEG-based surfactant or a polyoxyethylene-polyoxypropylene block
5 copolymer which is of low solubility in water.

1 170. (Original) A coated particle as in Claim 169 wherein the block copolymer is a Pluronic.

1 171. (Original) A coated particle with a core comprising a matrix consisting essentially of a
2 reversed cubic or reversed hexagonal phase comprising
3 water or glycerol or a water-glycerol mixture
4 a polyoxyethylene-polyoxypropylene block copolymer of low HLB

1 172. (Original) A coated particle as in Claim 171 wherein the block copolymer is a Pluronic.

1 173. (Original) A coated particle with a core comprising a matrix consisting essentially of a
2 reversed cubic or reversed hexagonal phase comprising
3 water or glycerol or a water-glycerol mixture, and
4 an amphiphilic block copolymer of low HLB.